Instructions: Complete each of the following exercises for practice.

1. Textbook problems 16.6.13 – 16.6.18 (matching parametric surfaces to their parametrizations).
2. Parametrize the given surface.
   (a) The plane passing through point $(0, -1, 5)$ and containing vectors $\langle 2, 1, 4\rangle$ and $\langle -3, 2, 5\rangle$.
   (b) The portion of the hyperboloid $4x^2 - 4y^2 - z^2 = 4$ satisfying $x \geq 0$.
   (c) The portion of the ellipsoid $x^2 + 2y^2 + 3z^2 = 1$ satisfying $y \geq 0$.
   (d) The portion of the sphere $x^2 + y^2 + z^2 = 4$ lying above the cone $z = \sqrt{x^2 + y^2}$.
   (e) The portion of the plane $z = x + 3$ lying inside the cylinder $x^2 + y^2 = 1$.
3. Compute an equation of the tangent plane to the parametric surface at the point.
   (a) $\mathbf{s}(u, v) = \langle u + v, 3u^2, u - v\rangle$ at $(2, 3, 0)$
   (b) $\mathbf{s}(u, v) = \langle u^2 + 1, v^3 + 1, u + v\rangle$ at $(5, 2, 3)$
   (c) $\mathbf{s}(u, v) = \langle \sin(u), \cos(u)\sin(v), \sin(v)\rangle$ when $u = \frac{\pi}{6}$ and $v = \frac{\pi}{6}$
   (d) $\mathbf{s}(u, v) = \langle u^2, 2u\sin(v), u\cos(v)\rangle$ when $u = 1$ and $v = 0$
4. Compute the area of the surface.
   (a) The portion of $3x + 2y + z = 6$ lying in the first octant.
   (b) The portion of $x + 2y + 3z = 1$ lying inside $x^2 + y^2 = 3$.
   (c) The portion of $z = \sqrt{x^2 + y^2}$ lying between $y = x$ and $y = x^2$.
   (d) The portion of $z = 4 - x^2 + y$ lying above the triangle with vertices $(0, 0)$, $(1, 0)$, and $(1, 1)$.
   (e) The portion of $z = xy$ lying within $x^2 + y^2 = 1$.
   (f) The portion of $y = x^2 + z^2$ lying within $x^2 + z^2 = 16$.
   (g) The surface parametrized by $\mathbf{s}(u, v) = \langle u^2, uv, \frac{1}{2}u^2\rangle$ for $0 \leq u \leq 1$ and $0 \leq v \leq 2$.
   (h) The portion of $x^2 + y^2 + z^2 = b^2$ lying inside $x^2 + y^2 = a^2$ where $0 < a < b$.